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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,873	09/29/2003	Gerald Harron	85195-302 ADB	5408
23529	7590	07/11/2007		
ADE & COMPANY INC. 2157 Henderson Highway WINNIPEG, MB R2G1P9 CANADA			EXAMINER ODOM, CURTIS B	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 07/11/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/671,873

Applicant(s)

HARRON ET AL.

Examiner

Curtis B. Odom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 April 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 4/30/2007 have been fully considered but they are not persuasive. Regarding Figs. 9-11 (see page 5 of the Remarks), the axis of each graph is still not labeled in the amended figures, thus the drawings are still objected to by the Examiner.

Further in the Remarks (see pages 6-7 of the Remarks), the Applicant states **"The Examiner fails to establish a prima facie case as required by the above. In discussing the matter, the Examiner merely states on page 5 at the end of the first paragraph that "Therefore it would have been obvious to one skilled in the art at the time the invention was made to modify the multi-carrier QAM method of Vankka with the delaying of Montojo et al since Montojo et al states the delaying of the carriers reduces peak to average power ratios."**

**However Vankka makes no statement nor even any suggestion that it is desirable to reduce peak to average ratios in a composite QAM signal and certainly does not suggest that this could be done using the technique of Montojo.**

**Montojo makes no mention of QAM signals nor any desirability of reduce peak to average ratios in a composite QAM signal. While Montojo provides a technique for reducing peak to average power ratio in a multi carrier signal, there is no specific mention of QAM signals.**

**There is therefore simply no motivation for these references to be combined as proposed by the Examiner.**

**It is submitted therefore that the Examiner has failed to establish a prima facie case as required in MPEP and that the rejection should be withdrawn.”**

However, it is the understanding of the Examiner that a prime facie case as required by the MPEP has been established. Three criteria must be satisfied in order to establish a prima facie case of obviousness: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine their teachings; (2) there must be a reasonable expectation of success; and **(3) the prior art reference (or combination of references) must teach or suggest all the claim limitations.** See MPEP §706.02(j), citing *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991).

**(1) There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine their teachings.** Vankka (US 2003/0206600) discloses creating a composite multi-carrier QAM signal created by adding four modulated carriers (see section 0079). Montojo et al. discloses creating a composite multi-carrier signal (see section 0003), wherein the composite signal has a reduced peak to average power ration (see section 0003). Montojo et al. further discloses the multi-carrier signal is also a QAM signal (see section 0021). Thus, since both references disclose modulating composite multi-carrier QAM signals, it is the understanding of the Examiner that there is suggestion to combine their teachings. Montojo et al. further states the delaying of the carriers reduces peak to average power ratios (see

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section 0003) which maintains a power amplifier within its linear operating range which reduces inter-modulation products (see section 0002) which the Examiner sees as motivation to combine the references.

**2) There must be a reasonable expectation of success.** Vankka (US 2003/0206600) discloses creating a composite multi-carrier QAM signal created by adding four modulated carriers (see section 0079). Montojo et al. discloses creating a composite multi-carrier signal (see section 0003), wherein the composite signal has a reduced peak to average power ratio (see section 0003). Montojo et al. further discloses the multi-carrier signal is also a QAM signal (see section 0021). Thus, since both references disclose processing composite multi-carrier QAM signals, it is the understanding of the Examiner that there is a reasonable expectation of success when combining the references.

**(3) The prior art reference (or combination of references) must teach or suggest all the claim limitations.** See rejection below.

Thus, based on the above disclosure, **it is the understanding of the Examiner that a prime facie case as required by the MPEP has been established**

### *Drawings*

2. The drawings are objected to because the axis of each graph should be labeled (see Figs 9-11). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if

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only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vankka (previously cited in Office Action 10/31/2006) in view of Montojo et al. (previously cited in Office Action 10/31/2006).

Regarding claim 1, Vankka discloses a method of generating a multi carrier quadrature amplitude modulation (QAM) signal (see Fig. 1, section 0004 and 0023) comprising:

creating (as described in section 0004) a plurality of four composite amplitude modulated QAM signals each using two carriers of the same local oscillator frequency wherein the two carriers are distinguished by having a phase shifted difference of 90 degrees;

wherein the QAM signals are of the same quadrature baseband modulation as shown in Fig. 1 (see also section 0004);

wherein the QAM signals have the similar local oscillator clocks (see section 0004), wherein the carrier branches are similar;

summing (at element 112 of Fig. 1) the QAM signals to form a composite multi carrier QAM signal (see section 0004); and

amplifying the composite QAM signal (see Fig. 10, block 104, see section 0079) for transmission;

However, Vankka does not disclose the QAM signal are of the same data rate and phase, wherein there is provided a symbol delay on one or more QAM signals prior to the signals being summed where the delay is computed such that peak QAM power transitions in the QAM signals statistically do not align in time.

However Montojo et al. discloses a multi-carrier transmitter system (Fig. 5, block 500, section 0023), wherein the carriers are modulated in blocks 300A-C, wherein also the modulation performed is QAM, wherein the same data rate is used in used in each modulator (as described in section 0021) according to a receiving destination. The modulated carriers are summed (see Fig. 5 element 502), to produce a resulting signal (element 504) which is shown in Fig. 4. According to Fig. 4, each carrier (460, 461, 462) has the same phase and bandwidth. Montojo et al. also discloses there is provided a symbol delay (see Fig. 5, 512B-C) on two QAM

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signals prior to the signals being summed, where the delay is computed based on a chip time (see section 0023) or a symbol time (see section 0028) such that the peak to average power ratio is reduced (see sections 0003 and 0013) since the peak values of each symbol are not aligned in time because of the delay. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the multi-carrier QAM modulation method of Vankka with the delaying of Montojo et al. since Montojo et al. states the delaying of the carriers reduces peak to average power ratios (see section 0003) which maintains a power amplifier within its linear operating range which reduces inter-modulation products (see section 0002).

Regarding claim 2, Montojo et al. further discloses the delay is arranged according to the equation: the additional delay for each QAM signal is equal to the symbol rate (duration) of the QAM signals divided by the number of QAM signals in summation (see section 0028), wherein each addition delay is  $1/3$  the symbol time or the symbol time divided by the number of signals (carriers), which is 3 in this case. It would have been obvious to include this feature since Montojo et al. states the delaying of the carriers reduces peak to average power ratios (see section 0003) which maintains a power amplifier within its linear operating range which reduces inter-modulation products (see section 0002).

Regarding claim 4, Montojo et al. discloses the delay is performed immediately prior to summation of the QAM signals (see Fig. 5, elements 512B-C). It would have been obvious to include this feature since Montojo et al. states the delaying of the carriers reduces peak to average power ratios (see section 0003) which maintains a power amplifier within its linear operating range which reduces inter-modulation products (see section 0002).

Regarding claim 6, Montojo et al. further discloses the carriers of the QAM signals are of equal level (see Fig. 4, carriers 461, 462, and 463). It would have been obvious to include this feature since Montojo et al. states the delaying of the carriers reduces peak to average power ratios (see section 0003) which maintains a power amplifier within its linear operating range which reduces inter-modulation products (see section 0002).

5. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vankka (previously cited in Office Action 10/31/2006) in view of Montojo et al. (previously cited in Office Action 10/31/2006) as applied to claim 1, and in further view of Keashly et al. (previously cited in Office Action 10/31/2006).

Regarding claims 3 and 5, Vankka and Montojo et al. do not disclose the delay is performed at any point in the modulation process of the QAM signal or the delay is performed in an RF stage of the composite QAM signal.

However, Keashly et al. also discloses a multi-channel (carrier) system including multiple channels (carriers) upconverted to an RF frequency and then combined for transmission (see column 4, lines 6-16). Time delays/offsets are introduced (see Fig. 5) in each radio frequency channel to prevent the signal peaks of each carrier (channel) from occurring at the same time to reduce peak power (see column 2, lines 27-39). The delays can be introduced at the beginning of a carrier modulation process (see column 5, lines 47-59) to produce a delayed bit stream for carrier modulation. Keashly et al. further discloses the time delay offsets can be introduced at any point prior to combining the channels (carriers) in the system (see column 2, lines 51-57). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to perform the delaying at any point prior to combining in Vankka and

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Montejo et al. including performing the delaying at an RF frequency prior to combination as disclosed by Keashly et al. since Keashly et al. states the delaying prevents the signal peaks of each carrier (channel) from occurring at the same time to reduce peak power (see column 2, lines 27-39) without adversely affecting the average signal power.

### ***Conclusion***

**6. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**7.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Curtis Odom  
July 8, 2007